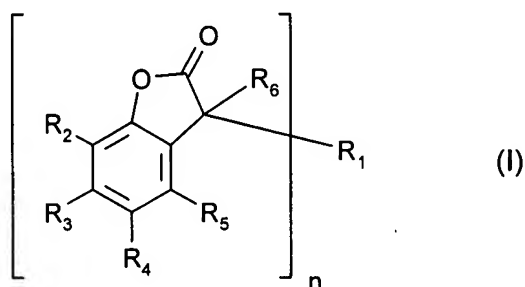


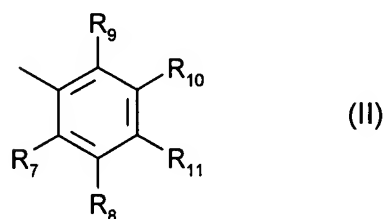
## IN THE CLAIMS:

1. (currently amended). A composition of matter normally subject to oxidative deterioration comprising an edible organic substance normally subject to oxidative deterioration and a minor amount effective as an antioxidant of one or more compounds selected from the group consisting of
- (i) 3-arylbenzofuranones in the present invention are compounds of the formula I



in which, if n is 1,

R<sub>1</sub> is unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-, C<sub>1</sub>-C<sub>4</sub>alkoxy-, C<sub>1</sub>-C<sub>4</sub>alkylthio-, hydroxyl-, halo-, amino-, C<sub>1</sub>-C<sub>4</sub>alkylamino-, phenylamino- or di(C<sub>1</sub>-C<sub>4</sub>alkyl)amino-substituted naphthyl, phenanthryl, anthryl, 5,6,7,8-tetrahydro-2-naphthyl, 5,6,7,8-tetrahydro-1-naphthyl, thienyl, benzo[b]thienyl, naphtho[2,3-b]thienyl, thianthrenyl, dibenzofuryl, chromenyl, xanthenyl, phenoxathiinyl, pyrrolyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, indoliziny, isoindolyl, indolyl, indazolyl, purinyl, quinoliziny, isoquinolyl, quinolyl, phthalazinyl, naphthyridinyl, quinoxalinyl, quinazolinyl, cinnoliny, pteridinyl, carbazolyl, β-carbolinyl, phenanthridinyl, acridinyl, perimidinyl, phenanthrolinyl, phenazinyl, isothiazolyl, phenothiazinyl, isoxazolyl, furazanyl, biphenyl, terphenyl, fluorenyl or phenoxazinyl, or R<sub>1</sub> is a radical of the formula II



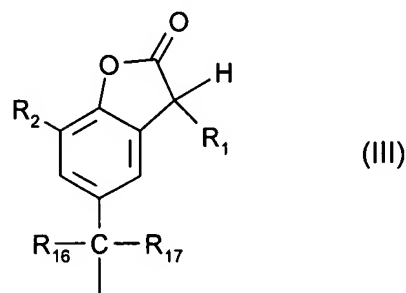
and

if n is 2,

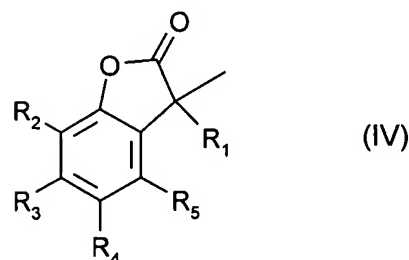
R<sub>1</sub> is unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl- or hydroxy-substituted phenylene or naphthylene; or is -R<sub>12</sub>-X-R<sub>13</sub>-, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> independently of one another are hydrogen, chlorine, hydroxyl, C<sub>1</sub>-C<sub>25</sub>alkyl, C<sub>7</sub>-C<sub>9</sub>phenylalkyl, unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted phenyl; unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted C<sub>5</sub>-C<sub>8</sub>cycloalkyl; C<sub>1</sub>-C<sub>18</sub>alkoxy, C<sub>1</sub>-C<sub>18</sub>alkylthio, C<sub>1</sub>-C<sub>4</sub>alkylamino, di(C<sub>1</sub>-C<sub>4</sub>alkyl)amino, C<sub>1</sub>-

C<sub>25</sub>alkanoyloxy, C<sub>1</sub>-C<sub>25</sub>alkanoylamino, C<sub>3</sub>-C<sub>25</sub>alkenoyloxy, C<sub>3</sub>-C<sub>25</sub>alkanoyloxy which is interrupted by oxygen, sulfur or  $\text{>N-R}_{14}$  ; C<sub>6</sub>-C<sub>9</sub>cycloalkylcarbonyloxy, benzoyloxy or C<sub>1</sub>-C<sub>12</sub>alkyl-substituted

benzoyloxy; or else the radicals R<sub>2</sub> and R<sub>3</sub> or the radicals R<sub>3</sub> and R<sub>4</sub> or the radicals R<sub>4</sub> and R<sub>5</sub>, together with the carbon atoms to which they are attached, form a benzo ring, R<sub>4</sub> is additionally -(CH<sub>2</sub>)<sub>p</sub>-COR<sub>15</sub> or -(CH<sub>2</sub>)<sub>q</sub>OH or, if R<sub>3</sub>, R<sub>5</sub> and R<sub>6</sub> are hydrogen, R<sub>4</sub> is additionally a radical of the formula III



in which R<sub>1</sub> is defined as indicated above for n = 1,  
R<sub>6</sub> is hydrogen or a radical of the formula IV



where R<sub>4</sub> is not a radical of the formula III and R<sub>1</sub> is defined as indicated above for n = 1,  
R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub>, R<sub>10</sub> and R<sub>11</sub> independently of one another are hydrogen, halogen, hydroxyl, C<sub>1</sub>-C<sub>25</sub>alkyl, C<sub>2</sub>-

C<sub>25</sub>alkyl interrupted by oxygen, sulfur or  $\text{>N-R}_{14}$  ; C<sub>1</sub>-C<sub>25</sub>alkoxy, C<sub>2</sub>-C<sub>25</sub>alkoxy interrupted by

oxygen, sulfur or  $\text{>N-R}_{14}$  ; C<sub>1</sub>-C<sub>25</sub>alkylthio, C<sub>3</sub>-C<sub>25</sub>alkenyl, C<sub>3</sub>-C<sub>25</sub>alkenyloxy, C<sub>3</sub>-C<sub>25</sub>alkynyl, C<sub>3</sub>-

C<sub>25</sub>alkynyloxy, C<sub>7</sub>-C<sub>9</sub>phenylalkyl, C<sub>7</sub>-C<sub>9</sub>phenylalkoxy, unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted phenyl; unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted phenoxy; unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted C<sub>5</sub>-C<sub>8</sub>cycloalkyl; unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted C<sub>5</sub>-C<sub>8</sub>cycloalkoxy; C<sub>1</sub>-C<sub>4</sub>alkylamino, di(C<sub>1</sub>-

C<sub>4</sub>alkyl)amino, C<sub>1</sub>-C<sub>25</sub>alkanoyl, C<sub>3</sub>-C<sub>25</sub>alkanoyl interrupted by oxygen, sulfur or  $\text{>N-R}_{14}$  ;

C<sub>1</sub>-C<sub>25</sub>alkanoyloxy, C<sub>3</sub>-C<sub>25</sub>alkanoyloxy interrupted by oxygen, sulfur or  $\text{>N-R}_{14}$  ;

C<sub>1</sub>-C<sub>25</sub>alkanoylamino, C<sub>3</sub>-C<sub>25</sub>alkenoyl, C<sub>3</sub>-C<sub>25</sub>alkenoyl interrupted by oxygen, sulfur or  $\text{>N-R}_{14}$  ;

C<sub>3</sub>-C<sub>25</sub>alkenoyloxy, C<sub>3</sub>-C<sub>25</sub>alkenoyloxy interrupted by oxygen, sulfur or  $\text{>N-R}_{14}$  ; C<sub>6</sub>-

C<sub>9</sub>cycloalkylcarbonyl, C<sub>6</sub>-C<sub>9</sub>cycloalkylcarbonyloxy, benzoyl or C<sub>1</sub>-C<sub>12</sub>alkyl-substituted benzoyl;

benzoyloxy or C<sub>1</sub>-C<sub>12</sub>alkyl-substituted benzoyloxy;  $\text{—O—}\overset{\overset{\text{R}_{18}}{|}}{\underset{\underset{\text{R}_{19}}{|}}{\text{C}}}\text{—}\overset{\overset{\text{O}}{||}}{\text{C}}\text{—R}_{15}$  or

$\text{—O—}\overset{\overset{\text{R}_{20}}{|}}{\underset{\underset{\text{H}}{|}}{\text{C}}}\text{—}\overset{\overset{\text{R}_{21}}{|}}{\underset{\underset{\text{R}_{22}}{|}}{\text{C}}}\text{—O—R}_{23}$  , or else, in formula II, the radicals R<sub>7</sub> and R<sub>8</sub> or the radicals R<sub>8</sub> and R<sub>11</sub>,

together with the carbon atoms to which they are attached, form a benzo ring,

R<sub>12</sub> and R<sub>13</sub> independently of one another are unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted phenylene or naphthylene,

R<sub>14</sub> is hydrogen or C<sub>1</sub>-C<sub>8</sub>alkyl,

R<sub>15</sub> is hydroxyl,  $\left[ \text{—O}^- \frac{1}{r} \text{M}^{r+} \right]$  , C<sub>1</sub>-C<sub>18</sub>alkoxy or  $\text{—N}\begin{matrix} \text{R}_{24} \\ \text{R}_{25} \end{matrix}$  ,

R<sub>16</sub> and R<sub>17</sub> independently of one another are hydrogen, CF<sub>3</sub>, C<sub>1</sub>-C<sub>12</sub>alkyl or phenyl, or R<sub>16</sub> and R<sub>17</sub>, together with the C atom to which they are attached, form a C<sub>5</sub>-C<sub>8</sub>cycloalkylidene ring which is unsubstituted or substituted from 1 to 3 times by C<sub>1</sub>-C<sub>4</sub>alkyl;

R<sub>18</sub> and R<sub>19</sub> independently of one another are hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl or phenyl,

R<sub>20</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub>alkyl,

R<sub>21</sub> is hydrogen, unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted phenyl; C<sub>1</sub>-C<sub>25</sub>alkyl, C<sub>2</sub>-C<sub>25</sub>alkyl interrupted by

oxygen, sulfur or  $\text{>N-R}_{14}$  ; C<sub>7</sub>-C<sub>9</sub>phenylalkyl which is unsubstituted or substituted on the phenyl

radical from 1 to 3 times by C<sub>1</sub>-C<sub>4</sub>alkyl; C<sub>7</sub>-C<sub>25</sub>phenylalkyl which is unsubstituted or substituted on the

phenyl radical from 1 to 3 times by C<sub>1</sub>-C<sub>4</sub>alkyl and interrupted by oxygen, sulfur or  $\text{N}-\text{R}_{14}$ , or

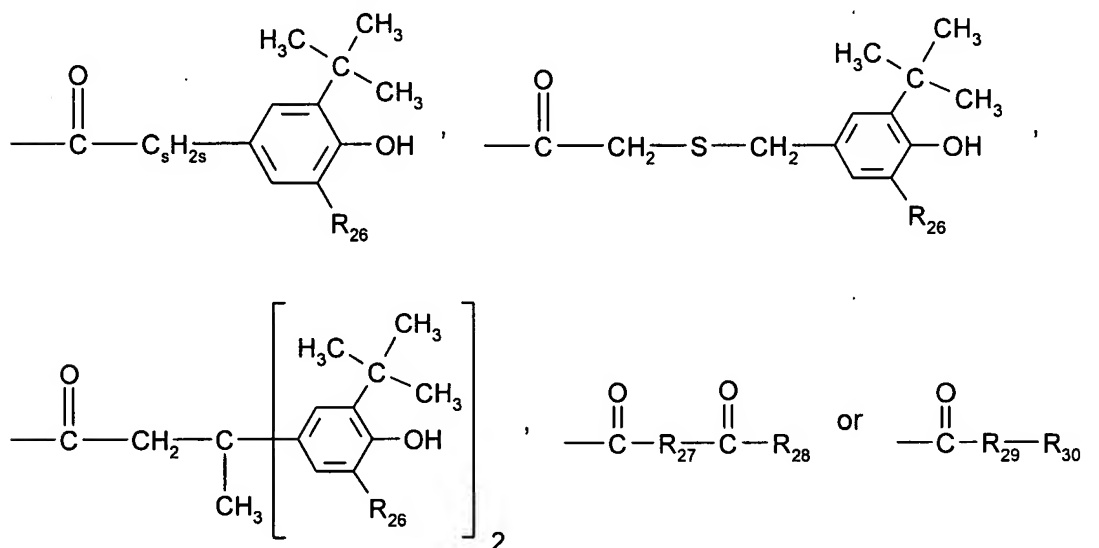
else the radicals R<sub>20</sub> and R<sub>21</sub>, together with the carbon atoms to which they are attached, form a C<sub>5</sub>-C<sub>12</sub>cycloalkylene ring which is unsubstituted or substituted from 1 to 3 times by C<sub>1</sub>-C<sub>4</sub>alkyl;

R<sub>22</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub>alkyl,

R<sub>23</sub> is hydrogen, C<sub>1</sub>-C<sub>25</sub>alkanoyl, C<sub>3</sub>-C<sub>25</sub>alkenoyl, C<sub>3</sub>-C<sub>25</sub>alkanoyl interrupted by oxygen, sulfur or

$\text{N}-\text{R}_{14}$ ; C<sub>2</sub>-C<sub>25</sub>alkanoyl substituted by a di(C<sub>1</sub>-C<sub>6</sub>alkyl)phosphonate group;

C<sub>6</sub>-C<sub>9</sub>cycloalkylcarbonyl, thenoyl, furoyl, benzoyl or C<sub>1</sub>-C<sub>12</sub>alkyl-substituted benzoyl;



R<sub>24</sub> and R<sub>25</sub> independently of one another are hydrogen or C<sub>1</sub>-C<sub>18</sub>alkyl,

R<sub>26</sub> is hydrogen or C<sub>1</sub>-C<sub>8</sub>alkyl,

R<sub>27</sub> is a direct bond, C<sub>1</sub>-C<sub>18</sub>alkylene, C<sub>2</sub>-C<sub>18</sub>alkylene interrupted by oxygen, sulfur or  $\text{N}-\text{R}_{14}$ ; C<sub>2</sub>-

C<sub>18</sub>alkenylene, C<sub>2</sub>-C<sub>20</sub>alkylidene, C<sub>7</sub>-C<sub>20</sub>phenylalkylidene, C<sub>5</sub>-C<sub>8</sub>cycloalkylene, C<sub>7</sub>-C<sub>8</sub>bicycloalkylene,

unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted phenylene, or or ,

R<sub>28</sub> is hydroxyl,  $\left[ -\text{O}^- \frac{1}{r} \text{M}^{r+} \right]$ , C<sub>1</sub>-C<sub>18</sub>alkoxy or  $\text{N}-\text{R}_{24}-\text{R}_{25}$ ,

$R_{29}$  is oxygen, -NH- or  $\begin{array}{c} \diagup \\ \text{N} - \text{C}(=\text{O}) - \text{NH} - R_{30} \\ \diagdown \end{array}$ ,

$R_{30}$  is  $C_1$ - $C_{18}$ alkyl or phenyl,

$R_{31}$  is hydrogen or  $C_1$ - $C_{18}$ alkyl,

M is an r-valent metal cation,

X is a direct bond, oxygen, sulfur or  $-NR_{31}-$ ,

n is 1 or 2,

p is 0, 1, or 2,

q is 1, 2, 3, 4, 5 or 6,

r is 1, 2 or 3, and

s is 0, 1 or 2;

wherein said edible organic substance is a food containing fatty acid glycerides, edible fats and fatty oils; and said edible organic substance is selected from the group consisting of potato flakes, bakery products, meat emulsions, precooked cereals, instant noodles, soybean milk, chicken products, sausage, mayonnaise, margarine, frozen fish, pet food, animal feed, frozen pizza and cheese; and said fatty acid glycerides contain from 12 carbon atoms to about 24 carbon atoms per ester site.

2. (original). The composition of claim 1 wherein the benzofuranone is at least one compound of formula I wherein  $n = 1$ ,  $R_1$  is phenyl which is unsubstituted or substituted in para-position by  $C_1$ - $C_{18}$ alkylthio or di( $C_1$ - $C_4$ alkyl)amino; mono- to penta-substituted alkyphenyl containing together a total of at most 18 carbon atoms in the 1 to 5 alkyl substituents; naphthyl, biphenyl, terphenyl, phenanthryl, anthryl, fluorenyl, carbazolyl, thienyl, pyrrolyl, phenothizinyll or 5,6,7,8-tetrahydronaphthyl, each of which is unsubstituted or substituted by  $C_1$ - $C_4$ alkyl,  $C_1$ - $C_4$ alkoxy,  $C_1$ - $C_4$ alkylthio, hydroxy or amino.

3. (original). The composition of claim 1 wherein the benzofuranone is a compound of formula I wherein  $n$  is 2,  $R_1$  is  $-R_{12}-X-R_{13}-$ ,  $R_{12}$  and  $R_{13}$  are phenylene, X is oxygen or  $-NR_{31}-$ , and  $R_{31}$  is  $C_1$ - $C_4$ alkyl.

4. (original). The composition of claim 1 wherein the benzofuranone is at least one compound selected from the group consisting of 3-[4-(2-acetoxyethoxy)phenyl]-5,7-di-tert-butyl-benzofuran-2-one; 5,7-di-tert-butyl-3-[4-(2-stearoyloxyethoxy)phenyl]benzofuran-2-one; 3,3'-bis[5,7-di-tert-butyl-3-(4-[2-hydroxyethoxy]phenyl)benzofuran-2-one]; 5,7-di-tert-butyl-3-(4-ethoxyphenyl)benzofuran-2-one; 3-(4-acetoxy-3,5-dimethylphenyl)-5,7-di-tert-butylbenzofuran-2-one; 3-(3,5-dimethyl-4-pivaloyloxyphenyl)-5,7-di-tert-butyl-benzofuran-2-one; 5,7-di-tert-butyl-3-phenylbenzofuran-2-one; 5,7-di-tert-butyl-3-(3,4-dimethylphenyl)-benzofuran-2-one; 5,7-di-tert-butyl-3-(2,3-dimethylphenyl)benzofuran-2-one.

5-13. (cancelled).

14. (previously presented). The composition of claim 1 wherein the antioxidant of component (i) is present in an amount of from about 0.005% by weight to about 5% by weight, based on the weight of the edible organic substance.

15. (previously presented). The composition of claim 1 wherein the antioxidant of component (i) is present in an amount of from about 0.01% by weight to about 1% by weight, based on the weight of the edible organic substance.

16. (original). The composition of claim 1 wherein the composition further comprises additional food additives selected from food antioxidants in addition to those specified in claim 1, emulsifiers, suspension agent and colorings.

17. (currently amended). The composition of claim 1 wherein the composition further comprises food antioxidants selected from the group consisting of butylated hydroxytoluene, benzylphosphonates, ~~esters of b-(3,5-di-tert-butyl-4-hydroxyphenyl)propionic acid with mono- or polyhydric alcohols, esters of b-(5-tert-butyl-4-hydroxy-3-methylphenyl)propionic acid with mono- or polyhydric alcohols, esters of b-(3,5-dicyclohexyl-4-hydroxyphenyl)propionic acid with mono- or polyhydric alcohols, esters of 3,5-di-~~

~~tert-butyl 4-hydroxyphenyl acetic acid with mono- or polyhydric alcohols, phosphites and phosphonites.~~

18-20. (cancelled).